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10/006,302	12/06/2001	Hui Tian	PIXMP011/P087	2658

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BEYER WEAVER & THOMAS LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER
BHATNAGAR, ANAND P

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/006,302	TIAN, HUI
	Examiner	Art Unit	
	Anand Bhatnagar	2623	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on <u>06 December 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17 and 19-23* is/are rejected.

7)☒ Claim(s) *18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>06 December 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed
publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-3, 9, and 11 are rejected under 35 U.S.C. 102(a) as being

anticipated by Kondo et al. (U.S. patent 6,215,421).

Regarding claim 1: Kondo et al. discloses a method for hiding information

in images (Kondo et al.; col. 1 lines 13-15), the method comprising the operations

of:

providing information sought to be hidden (fig. 8; element 41, wherein

additional information is provided to be embedded);

preparing the information sought to be hidden for insertion into an image

(col. 9 lines 22-25, wherein the information is converted into a format which is

compatible for embedding with the image, i.e. is prepared for embedding);

providing image data configured as a plurality of bit planes (col. 9 lines 31-

44);

selecting a suitable bit plane from among the plurality of bit planes for the

insertion of the information (col. 9 lines 45-51, wherein information is embedded

into the bit planes); and

inserting the information sought to be hidden into the image (col. 9 lines 45-51, wherein information is embedded into the bit planes).

Regarding claim 2: A method wherein the operation of inserting the information sought to be hidden into the image comprises inserting the information into the suitable bit plane (col. 9 lines 45-51, wherein information is embedded into the bit planes).

Regarding claim 3: A method wherein the operation of preparing the information sought to be hidden for insertion into an image includes encoding the information (col. 1 lines 41-47, wherein the data to be embedded is coded).

Regarding claim 9: A method wherein the operation of providing an image data configured as a plurality of bit planes includes providing a plurality of bit planes wherein one of the bit planes defines a most significant bit plane and wherein another one of the bit planes defines a least significant bit plane (fig. 7 and col. 9 lines 35-44, wherein the bit planes are arranged from most significant bit plane to least significant bit plane).

Regarding claim 11: A method wherein the operation of providing an image configured as a plurality of bit planes includes providing an image configured in at least eight bit planes numbered sequentially from the most significant bit plane to the least significant bit plane (fig. 7 and col. 9 lines 35-44, wherein the bit planes are arranged from most significant bit plane to least significant bit plane. Wherein 8 bits are assigned for each pixels).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the
invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

A.) Claims 4-8, 19, 20, 22, and 23 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Kondo et al. (U.S. patent 6,215,421) and Heller et al.

(U.S. patent 6,396,539 B1).

Regarding claim 4: A method wherein the operation of preparing the

information further includes the step of encrypting the information.

Kondo et al. discloses a system to embed/encode additional data into bit

planes of an image (Kondo et al.; col. 9 lines 45-51). Kondo et al. does not teach

to encrypt information into an image. Heller et al. teaches to encrypt

security/identification information into the image data (Heller et al.; col. 5 lines 1-6

and 41-46). It would have been obvious to of skilled in the art to combine the

teaching of Heller et al. to that of Kondo et al. because they are analogous in

embedding information into images. One in the art would have been motivated to

incorporate the teaching, of encryption, of Heller et al. into the system of Kondo

et al. in order to keep a unauthorized individual from locating/accessing the

hidden data and prevent any kind of alteration/removal/ or deleting of this hidden

data by the unauthorized individual.

Regarding claims 5 and 6: A method as in Claim 3, wherein the information comprises watermark information.

Kondo et al. discloses a system to embed/encode additional data into bit planes of an image (Kondo et al.; col. 9 lines 45-51). Kondo et al. does not teach for the information that is to be embedded into an image to be watermark data. Heller et al. teaches to encrypt security/identification information into the image data (Heller et al.; col. 5 lines 1-6 and 41-46, wherein the security information is read as watermark data). It would have been obvious to of skilled in the art to combine the teaching of Heller et al. to that of Kondo et al. because they are analogous in embedding information into images. One in the art would have been motivated to incorporate the teaching, of embedding watermark data, of Heller et al. into the system of Kondo et al. in order to keep a unauthorized individual from locating/accessing the hidden data and prevent any kind of alteration/removal/ or deleting of this hidden data by the unauthorized individual.

Regarding claims 7 and 8: A method as in Claim 3, wherein the information comprises messages.

Kondo et al. discloses a system to embed/encode additional data into bit planes of an image (Kondo et al.; col. 9 lines 45-51). Kondo et al. does not teach for the information to be embedded into an image to be message data. Heller et al. teaches to encrypt security/identification information into the image data (Heller et al.; col. 5 lines 1-6 and 41-46, the identification data is read as message data). It would have been obvious to of skilled in the art to combine the

teaching of Heller et al. to that of Kondo et al. because they are analogous in embedding information into images. One in the art would have been motivated to incorporate the teaching, of embedding messages, of Heller et al. into the system of Kondo et al. in order to keep a unauthorized individual from locating/accessing the hidden data and prevent any kind of alteration/removal/ or deleting of this hidden data by the unauthorized individual.

Regarding claim 19: It is rejected for the same reason as claim 1 and for the following limitation of: providing an image sensor having a digital pixel sensor, analog to digital conversion circuitry, image conversion circuitry, and memory all formed on a single chip.

Kondo et al. discoses to read a digital image and decompose it into bit planes for embedding information into the bit planes. Kondo et al. does not teach to have "a image sensor having a digital pixel sensor, analog to digital conversion circuitry, image conversion circuitry, and memory all formed on a single chip" performing the embedding process. Heller et al. teaches a ystem on a single chip composed of a CMOS array which reads the image data, digitizes the information, and stores it into a memory and then embeds information into this digitized data (Heller et al.; col. 3 lines 53-67 and col. 5 lines 1-6). It would have been obvious to of skilled in the art to combine the teaching of Heller et al. to that of Kondo et al. because they are analogous in embedding information into images. One in the art would have been motivated to incorporate the teaching, a single chip composed of all the elements (A/D converter, memory, etc.) needed

which can be modified in any of a myriad possible combinations (such as

substituting the CMOS array and the A/D converter for a digital array, digital

array with a A/D converter, etc.), of Heller et al. into the system of Kondo et al. in

order to make the system more efficient by limiting the number of processes

needed to take place for reading an image and/or embedding information.

Regarding claim 20: The method wherein the operation of providing the

information sought to be hidden includes encoding the information in an

appropriate format and encrypting the information (See claim 1 and claim 4).

Regarding claims 22 and 23: See claims 15 and 19.

B.) Claims 10, 12-17, and 21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kondo et al. (U.S. patent 6,215,421).

Regarding claims 10 and 12-14: A method wherein the operation of

selecting a suitable bit plane from among the plurality of bit planes includes

selecting a bit plane that is not the most significant bit plane and that is not the

least significant bit plane.

Kondo et al. discloses a system to embed/encode additional data into bit

planes of an image (Kondo et al.; col. 9 lines 45-51). Kondo further discloses to

embed information into bit planes. Kondo et al. does not teach to pick a specific

bit plane to embed into which is one that is not the most significant nor the least

significant bit plane. It is a matter of configuration/design choice of which bit

plane, more than one bit plane, or all the bit planes to embed a watermark into

based on image information (such as texture, colors, etc.), watermark information (such as size, length, etc.), which processes are taking place in the system (such as compression, quantization, etc.), etc. in order to embed in such a way to prevent any degradation of the image data, make sure the watermark is not noticeable in the image and is robust, etc.

Regarding claim 15: A method wherein the operation of selecting a suitable bit plane from among the plurality of bit planes includes:

conducting trial insertions of the information sought to be hidden into various bit planes to create trial images; and

comparing the trial images with an original image that does not have the inserted information until the trial image meets with some predetermined comparison criteria, and once a trial image meets with the predetermined criteria, the bit plane used to meet the predetermined criteria is selected as the suitable bit plane.

Kondo et al. discloses a correlation method to determine the best place to embed information into (col. 4 lines 1-9 and 55-65). Kondo et al. does not teach a trial and error method wherein the information is embedded into different bit planes/regions and is compared to a threshold/suitable criteria to decide if embedding should take place in the specific region/bit plane. This is a matter of configuration/design choice to perform trials until a suitable criteria/threshold is met and to embed into the specific region/bit plane when this is satisfied.

Regarding claim 16: It is rejected for the combination of reasons of claim

10 and 12-14 with that of claim 15.

Regarding claim 17: It is rejected for the same reason as claim 16 above

and for the following limitation of: dividing the selected bit plane into at least one

block of pixels (Kondo et al.; col. 9 lines 31-38).

Regarding claim 21: (See claim 15).

Allowable Subject Matter

3.   Claim 18 is objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Radha et al. (U.S. patent 6,501,397) for a bit plane encoder.

Contact Information

5.   Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Anand Bhatnagar whose telephone number is

(703) 306-5914, whose supervisor is Amelia Au whose number is 703-308-6604,

group fax is 703-872-9306, and Tech center 2600 customer service office

number is 703-306-0377.

Jon Chang
Primary Examiner

Anand Bhatnagar

Art Unit 2623

January 23, 2005